

WHAT IS CLAIMED IS:

1. A tray transfer apparatus comprising:

a transfer plate, the transfer plate including

a plurality of tray holders arranged and configured for the
selective support and release of a tray, the tray including an array of pockets for
receiving semiconductor devices;

an array of detecting means arranged and configured to detect the
presence of more than one semiconductor device in one of the pockets of a
supported tray;

wiring means connecting the detecting means to an input/output
terminal; and

driving means arranged and configured for controlled vertical and
horizontal movement of the transfer plate.
2. The tray transfer apparatus according to claim 1, wherein:

the detecting means are detecting switches.

3. The tray transfer apparatus according to claim 2, wherein:

the detecting switches are mechanical contact type push-button switches, and

the detecting switches included in the array of detecting means are connected in a parallel configuration.

4. The tray transfer apparatus according to claim 2, wherein:

the transfer plate includes a top surface, a bottom surface and an array of installation holes extending through the transfer plate; and further wherein

the detecting switches extend through the installation holes and below a plane defined by the bottom surface of the transfer plate.

5. The tray transfer apparatus according to claim 4, further comprising:

a detecting substrate, the detecting substrate having an upper surface and a lower surface, wherein

the detecting switches are arranged on the lower surface of the detecting substrate; and

the detecting substrate is mounted on the top surface of the transfer

plate, thereby extending the detecting switches through the installation holes.

6. The tray transfer apparatus according to claim 5, wherein:

the detecting switches are mounted on the lower surface of the detecting substrate by a method selected from soldering and friction fit:

7. The tray transfer apparatus according to claim 1, wherein:

the transfer plate includes a rotatable member arranged at a periphery of the transfer plate and extending above and below the transfer plate;

a catch finger connected to a lower extension of the rotatable member;
and

an actuation means connected to an upper extension of the rotatable member, whereby the rotatable member may be selectively rotated to move the catch finger between a supporting position and a releasing position.

8. The tray transfer apparatus according to claim 2, further comprising:

a control substrate for generating a control signal, the control signal corresponding to an activation status of the detecting switches.

9. The tray transfer apparatus according to claim 8, wherein:

the control substrate further includes a flashing circuit arranged and configured to generate flash signals corresponding to the activation status of the detecting switches.

10. The tray transfer apparatus according to claim 9, wherein:

the flashing circuit includes a NE555 circuit.

11. The tray transfer apparatus according to claim 8, wherein:

the control substrate includes a direct current to alternating current rectifier.

12. An automatic test handler comprising:

a plurality of tray stockers arranged and configured for receiving and positioning trays, the trays including an array of pockets with each pocket being sized and configured to receive and hold a semiconductor device;

a tray transfer unit including a transfer plate arranged and configured to

transfer and position a supported tray, an array of detecting switches arranged and configured to indicate the presence of more than one semiconductor device in a pocket of the supported tray, a detecting substrate and a driving means;

a tester for performing electrical tests on the semiconductor devices;

a first chamber for establishing a first temperature condition in the semiconductor devices under which the semiconductor devices will be tested;

a second chamber for restoring the tested semiconductor device to the normal temperature;

a pick and place device arranged and configured for removing the semiconductor devices from the pockets and for placing the semiconductor devices into the pockets; and

a controller for controlling the stockers, the tester, the tray transfer unit, the pick and place device and the first and second chambers.

13. The automatic test handler according to claim 12, wherein:

the controller is incorporated within the tray transfer unit.

14. The automatic test handler of claim 12, wherein:

the controller generates a test stop signal corresponding to the activation status of the detecting switches.

15. The automatic test handler according to claim 12, further comprising:

an alarm means for generating an alarm signal corresponding to the activation status of the detecting switches.

16. The automatic test handler according to claim 12, further comprising:

a control substrate arranged and configured for providing power to the detecting substrate and for generating flash signals according to the activation status of the detecting switches.